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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,172	07/15/2003	Keisuke Asami	Q88514	9478
23373	7590	08/22/2005	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			TURNER, SAMUEL A	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No.	Applicant(s)	
	10/620,172	ASAMI ET AL.	
	Examiner	Art Unit	
	Samuel A. Turner	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/15/03</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restriction

Applicant's election without traverse of claims 1-5 in the reply filed on 16 May 2005 is acknowledged.

Title

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Abstract

The abstract of the disclosure is objected to because the abstract exceeds 50-150 word. Correction is required. See MPEP § 608.01(b).

Drawings

The drawings are objected to because figures 5-7 must be labeled as

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

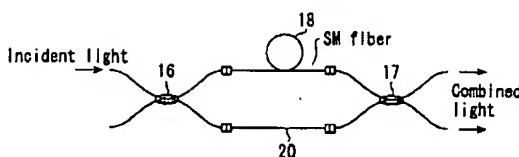
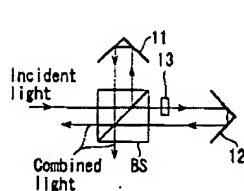
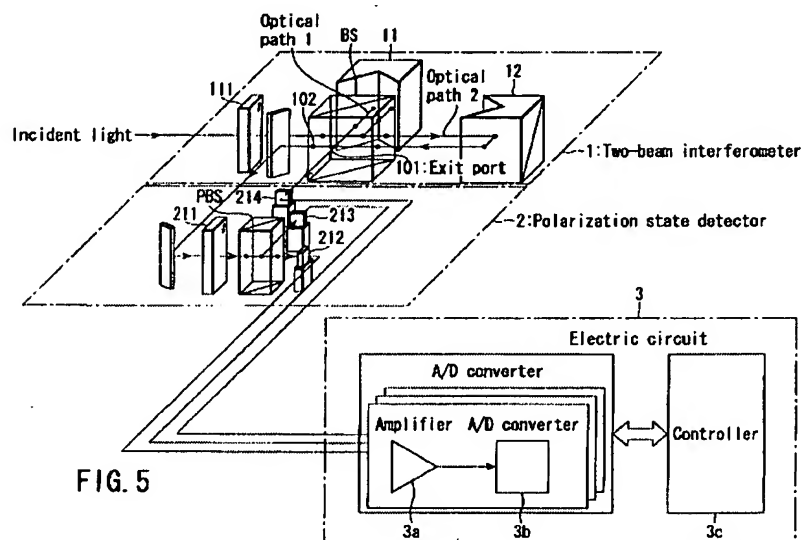
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda(6,697,160).



With regard to claim 1, Tsuda teaches a wavelength meter comprising:
 a first polarizer(111) for forming light outputted from the tunable laser source into a linearly polarized beam with a polarizing angle of 45 degrees;
 a beam splitter(BS) for dividing a beam transmitted through the polarizer into two beams;

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first reflecting means(11 or 12) for reflecting one of the two beams divided by the beam splitter and causing the reflected one to again enter the beam splitter; and

a polarizing beam splitter(PBS) for dividing output light recombined by the beam splitter into two mutually perpendicular components, and outputting the respective components to first and second photodetectors. See figure 5.

However Tsuda fails to teach a wave plate for performing $\lambda/8$ phase-shifting, the wave plate allowing the other of the two beams divided by the beam splitter to double-pass through the wave plate by being reflected by a second reflecting plate and causing the other to enter the beam splitter in figure 5. In figure 7a Tsuda teaches a wave plate(13) used to change the polarization state of one of the beams.

With regard to claim 2, Tsuda teaches a wavelength meter comprising: a first polarizer(111) for forming light outputted from the tunable laser source into a linearly polarized beam with a polarizing angle of 45 degrees; and a beam splitter(BS) for dividing a beam transmitted through the polarizer into two beams. Figure 5 is a two beam two beam interferometer with a Michelson configuration.

Note at Column 12, lines 31-36 that Tsuda teaches that any two beam interferometer can be used including a Mach-Zehnder interferometer. While fails to specifically teach a polarizing beam splitter and first and second reflecting means for recombining the beams divided by the beam splitter,

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separating the recombined beams into two mutually perpendicular polarized components, and outputting the respective components to first and second photodetectors as output light; and

a wave plate for performing $\lambda/4$ phase-shifting, the wave plate being inserted in either one of optical paths divided by the beam splitter. The beam splitter and reflectors are known bulk element Mach-Zehnder components. In figure 7e Tsuda teaches a fiber Mach-Zehnder arrangement using a single mode fiber(18) to alter the polarization state, a wave plate.

With regard to claim 1, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the interferometer of figure 5 by placing a wave plate in one of the Michelson interferometer paths in order to change the polarization state of one of the beams motivation for this modification is found in Tsuda figure 7a.

With regard to claim 2, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the interferometer of figure 5 by replacing the Michelson interferometer with an equivalent two beam Mach-Zehnder interferometer, motivation found at column 12, lines 31+. By modifying the combining beam splitter of the Mach-Zehnder interferometer into a polarization beam splitter the elements of the polarization state detector(2) found in Tsuda figure 5 can be reduced by connecting the detectors(212,213) directly to the outputs of the Mach-Zehnder interferometer, motivation can be found in In re Japikse, 86 USPQ 70 since it

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has been held that rearranging parts of an invention involves only routine skill in the art.

With regard to claim 4, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the input polarizer with any equivalent polarizer including a polarization maintaining fiber.

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dimmick(5,841,536).

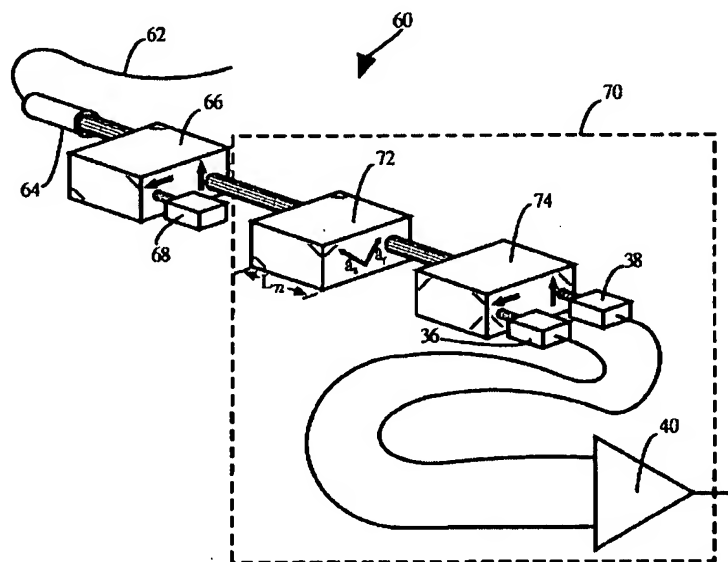


FIG. 4

With regard to claim 3, Dimmick teaches a wavemeter comprising:
a first polarizer for forming light outputted from the tunable laser source into
a linearly polarized beam with a polarizing angle of 45 degrees, polarizing

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beam-splitter(66) which acts as an input polarizer oriented at 45° to the axes(f,g) of retarder(72), see column 7, lines 32+;

a delay unit for vectorially decomposing light outputted from the first polarizer and delaying one of components with respect to the other, retarder(72);

a beam splitter for dividing light passed through the delay unit into two beams, polarizing beam-splitter(72).

Dimmick fails to specifically teach a first photodetector for receiving one of the two beams divided by the beam splitter via a $\lambda/4$ phase-shifting wave plate and a second polarizer; and a second photodetector for receiving the other of the two beams divided by the beam splitter via a third polarizer. Instead Dimmick teaches the polarization beam-splitter(72) and detectors(36,38). See figure 4.

With regard to claim 3 it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Dimmick apparatus by replacing the polarizing beam splitter(74) with a non-polarizing beam-splitter. This would necessitate the addition of polarizers between the beam-splitter and the detector(36,38) in order to combine the orthogonal beams from retarder(72) so interference can occur. An additional $1/4$ wave plate must be added to provide outputs 90° apart, as from the polarizing beam splitter(74). The polarizing beam-splitter(74) and detectors(36,38) are optically equivalent to a non-polarizing beam splitter which would split the

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input beam into two beams, a 1/4 wave plate which rotates the polarizations of one of the beams by 90°, and polarizers to mix the orthogonal polarizations for interference at the detectors. Thus Official Notice is taken that these different configurations are optically equivalent. Motivation for any modification can be the simple availability of a polarization beam splitter.

With regard to claim 4, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace bulk optical elements with fiber equivalents, see column 7, lines 33-34.

With regard to claim 5, beam-splitter(66) would act as the additional beam splitter.

Relevant Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Frankel(6,462,827) which teaches another polarization based wavemeter.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is **571-272-2432**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on **571-272-2800 ext. 77**.

The fax phone number for the organization where this application or proceeding is assigned is **703-872-9306**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).

A handwritten signature in black ink, appearing to read 'S. A. Turner', with a long, sweeping horizontal line extending to the right.

Samuel A. Turner
Primary Examiner
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